REMARKS

The Office Action made on March 11, 2003, enumerates a single obviousness rejection related to the claims in this application and discusses the restriction rejection.

Obviousness Rejection

Claims 1-11 were rejected under 35 USC § 103(a) as being obvious over Hatch, U.S. Patent No. 5,667,675 in view of the prior art discussed on pages 1-4 of the background of the invention section of this application which related to disassembly of prior art chromatography columns to perform invasive maintenance.

Hatch is a "Collapsible Apparatus for compressing packing material in liquid chromatography columns and method of its use" (TITLE). The apparatus disclosed has a compression rod coupled to a compression piston. A chromatography column cylinder is placed in the apparatus and held by "an appropriate adaptor" (Column 3, lines 46-47). The cylinder is then filled with a suspension of stationary phase. (Column 3, lines 51-53). Next, the movable bed support piston is "subjected to a compressive force by the compression piston, which causes the movable bed support to travel downward within the column tube in an axial direction until excess slurry solvent is expelled and the stationary phase is compacted." (Column 3, lines 56-60). Finally, and most important: "**The column is then ready for operation and may be connected to a liquid chromatographic system for use**." (Column 3, lines 60-62) (emphasis added). There is no provision, teaching or capability disclosed in Hatch to add liquid product to a slurry media located in the apparatus since it is a mere compactor. The apparatus in Hatch serves as "pre-packing" type device to pack, or re-pack, the column prior to, and independent of, "connecting to a liquid chromatographic system for use" processing liquid product.

The independent claims, namely claims 1 and 8 have been amended to require the chromatography column be provided with a dispersion section having a product inlet. Furthermore after lowering the plunger to the operational position with the drive system, liquid product is then provided to the column with the plunger in the operational position without withdrawing the plunger. This distinguishes the operation of Hatch and the prior art combination

reference by the Examiner. There is no teaching or suggestion in the cited combination of references to provide a chromatography column equipped with a dispersion section having the claimed capability of lifting the plunger, performing maintenance, restoring the plunger to an operational position and then running product through the column. In the combination of references the column must be first "connected to a liquid chromatographic system" prior to running product through the column which would necessitate removal of the plunger in Hatch since it is located where the dispersion section of a liquid chromatographic system is normally positioned in the prior art.

Through the amendment provided herein, claims 1-11 are now believed to be allowable, and such favorable action is respectfully requested.

Restriction Requirement

The Applicant acknowledges the finality of the restriction requirement imposed by the Examiner and may file a divisional application for the apparatus claims after further prosecution of the method claims. The apparatus claims are cancelled through the enclosed amendment.

Conclusion

No additional fees for additional claims are believed to be necessary. Any overpayment or underpayment should be accounted to Deposit Account No. 13-3403. Through this amendment to the claims, pending claims 1-11 are now believed to be allowable.

Respectfully submitted,

Date: June 11, 2003

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Enclosures: Claims

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CLEAN VERSION OF CLAIMS

1. A method of accessing the interior of a chromatography column comprising the steps of:

a) providing a chromatography column having a dispersion section connected to a product inlet and a cylinder with a plunger connected to a drive system, said plunger moveable within a cavity of the cylinder in an operational mode, and a collecting section opposing the dispersion section;

b) raising the plunger and dispersion section with the drive system a predetermined distance above a top of the cavity to a first maintenance position;

c) performing intrusive maintenance within the column without removing the plunger from the column;

d) lowering the plunger and dispersion section to an operational position within the cylinder with the drive system; and then

e) introducing product from the product inlet into the cylinder through the dispersion section with the plunger remaining in the cylinder.

2. The method of claim 1 wherein the step of the intrusive maintenance performed further comprises replacement of a screen connected to the plunger by at least a nut.

3. The method of claim 2 wherein the step of the replacement of the screen further comprises removing the nut located substantially at the center of the plunger.

4. The method of claim 2 wherein the step of replacement of the screen further comprises removing the distributor plate.

5. The method of claim 1 wherein the step of raising the plunger a predetermined distance further comprises raising the plunger at least six inches.

6. The method of claim 5 wherein the step of raising the plunger a predetermined distance further comprises raising the plunger about one foot.

7. The method of claim 1 further comprising the step of engaging a safety mechanism after raising the plunger, and disengaging the safety mechanism before lowering the plunger.

8. A method of accessing the interior of a chromatography column comprising the steps of:

a) providing a chromatography column having a dispersion section with a product inlet, a cylinder connected to base in an operational mode, and a drive system;

b) disconnecting the cylinder from the base;

c) raising the cylinder a predetermined distance above the base with the drive system to a first maintenance position;

d) performing maintenance within the column; and

e) lowering the plunger to the operational mode with the drive system returning the cylinder to the base;

f) reconnecting the cylinder to the base; and then

g) introducing liquid product through the product inlet into the cylinder with the plunger in the operational mode.

9. The method of claim 8 wherein the drive system is connected to a plunger in the operational and further comprising the step of raising the plunger with the cylinder during the step of raising the cylinder the predetermined distance.

10. The method of claim 8 wherein the step of performing maintenance further comprises removing a screen.

11. The method of claim 10 wherein the step of providing a chromatography column further comprises locating the screen at least partially between the cylinder and the base in the operational mode.

VERSION SHOWING CHANGES MADE*

CLAIMS

Having thus set forth the nature of the invention, what is claimed herein is:

1. (Amended) A method of accessing the interior of a chromatography column comprising the steps of:

a) providing a chromatography column having a dispersion section connected to a product inlet and a cylinder with a plunger connected to a drive system, said plunger moveable within a cavity of the cylinder in an operational mode, and a collecting section opposing the dispersion section;

b) raising the plunger and dispersion section with the drive system a predetermined distance above a top of the cavity to a first maintenance position;

c) performing intrusive maintenance within the column without removing the plunger from the column; [and]

d) lowering the plunger and dispersion section to an operational position within the cylinder with the drive system; and then

e) introducing product from the product inlet into the cylinder through the dispersion section with the plunger remaining in the cylinder.

2. The method of claim 1 wherein the step of the intrusive maintenance performed further comprises replacement of a screen connected to the plunger by at least a nut.

3. The method of claim 2 wherein the step of the replacement of the screen further comprises removing the nut located substantially at the center of the plunger.

4. The method of claim 2 wherein the step of replacement of the screen further comprises removing the distributor plate.

5. The method of claim 1 wherein the step of raising the plunger a predetermined distance further comprises raising the plunger at least six inches.

6. The method of claim 5 wherein the step of raising the plunger a predetermined distance further comprises raising the plunger about one foot.

7. The method of claim 1 further comprising the step of engaging a safety mechanism after raising the plunger, and disengaging the safety mechanism before lowering the plunger.

8. (Amended) A method of accessing the interior of a chromatography column comprising the steps of:

a) providing a chromatography column having a dispersion section with a product inlet, a cylinder connected to base in an operational mode, and a drive system;

b) disconnecting the cylinder from the base;

[b)] c) raising the cylinder a predetermined distance above the base with the drive system to a first maintenance position;

[c)]d) performing maintenance within the column; and

[d)]e) lowering the plunger to the operational mode with the drive system returning the cylinder to the base;

f) reconnecting the cylinder to the base; and then

g) introducing liquid product through the product inlet into the cylinder with the plunger in the operational mode.

9. The method of claim 8 wherein the drive system is connected to a plunger in the operational and further comprising the step of raising the plunger with the cylinder during the step of raising the cylinder the predetermined distance.

10. The method of claim 8 wherein the step of performing maintenance further comprises removing a screen.

11. The method of claim 10 wherein the step of providing a chromatography column further comprises locating the screen at least partially between the cylinder and the base in the operational mode.

12. Cancelled.

13. Cancelled.

14. Cancelled.

15. Cancelled.

16. Cancelled.

17. Cancelled.

18. Cancelled.

19. Cancelled.

20. Cancelled.